VT-HMI 3081

User's Manual

Vantron Technology

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Revision History:

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1	V1.0	First release	Apr. 25, 2008
2	V1.1	Update Ordering Information	Sept. 17, 2008
3	V1.2	Add VESA Information	Jan. 25, 2010

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1 Foreword

1.1 Copyright Notice

While all information contained herein has been carefully checked to assure its accuracy in technical details and printing, Vantron assumes no responsibility resulting from any error or features of this manual, or from improper uses of this manual or the software. Please contact our technical department for relevant operation solutions if there is any problem that cannot be solved according to this manual.

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Vantron Technology（Vantron）
E-mail: sales@vantrontech.com

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1.2 Notes

Applicable notes are listed in the following table:

Sign	Notice Type	Description
	Notice	Important information and regulations
	Caution	Caution for latent damage to system or harm to personnel

1.3 Statement

It is recommended to read and comply with this manual before operating VT-HMI which provides important guidance and helps decreasing the danger of injury, electric shock, fire, or any damage to the device.

1.4 Disclaimer

Vantron assumes no legal liability of accidents resulting from failure of conforming to the safety instructions.

1.5 Limitation of Liability/Non-warranty

For direct or indirect damage to this device or other devices of Vantron caused by failure of conforming to this manual or the safety instructions on device label, Vantron assumes neither warranty nor legal liability even if the device is still under warranty.

1.6 Safety Instructions

- ✧ Keep and comply with all operation instructions, warnings, and information.
- ✧ Pay attention to warnings on this device.
- ✧ Read the following precautions so as to decrease the danger of injury, electric shock, fire, or any damage to the device.

1.7 Precautions

- ✧ Pay attention to the product labels/safety instructions printed on silk screens.
- ✧ Do not try repairing this product unless declared in this manual.
- ✧ Keep away from heat source, such as heater, heat dissipater, or engine casing.
- ✧ Do not insert other items into the slot (if any) of this device.
  - Keep the ventilation slot ventilated for cooling.
  - System fault may arise if other items are inserted into this device.
- ✧ Installation: ensure correct installation according to instructions from the manufacturer with recommended installation tools.
- ✧ Ensure ventilation and smoothness according to relevant ventilation standard.

1.8 Safety Instructions for Power Cables and Accessories

Proper power source only

Start only with power source that satisfies voltage label and the voltage necessary according to this manual. Please contact technical support personnel of Vantron for any uncertainty about the requirements of necessary power source.

Use tested power source

This product still contains a button lithium battery as a real-time clock after its external power source is removed and therefore should not be short-circuited during transportation or placed under high temperature.

Place cables properly:

Do not place cables at any place with extrusion danger.

Cleaning Instructions

- Please power off before cleaning the device.
- Do not use spray detergent.
- Clean with a damp cloth.
- Do not try cleaning exposed electronic components unless with a dust collector.
- Support for special fault: Power off and contact technical support personnel of Vantron in case of the following faults:
  - The device is damaged.
  - The temperature is excessively high.
  - Fault is still not solved after the operation according to the manual.

2 Overview

2.1 Introduction

Thank you for choosing Vantron. It is our commitment to provide our valued customers with the embedded devices equipped with the state-of-the-art technology and the best product services.

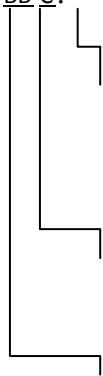
HMI, the abbreviation for Human-Machine Interface, enables the interaction between operators/users and applications, connects industrial control products such as PLC, transducer, DC speed regulator, meter, etc. HMI adopts a display for displaying and input units such as touch screen, keyboard, mouse, etc. for writing working parameters or inputting operation commands. As a digital device for realizing information interaction between human and machine, HMI is composed of hardware and software. Based on its ample function interfaces and powerful user operational interface, it is very suitable for control units such as medical device, intelligent transportation, industrial field, etc.

Vantron's VT-HMI products are based on the most advanced ARM and Intel Atom processors and have low-power consumption and high integration. The products are designed for applications such as industrials, medicals, and transportations, etc.

2.2 Product Series

2.2.1 Product Order Coding Rule

VT-HMI- A BB C：



Type suffix:

1: Basic type;

2: Enhanced type or other types

Screen size:

07, 08, 10, 15: for LCD in 7, 8, 10, 15 inches.

Product series:

3：PXA270 ARM10 processor platform

5：IMX31 ARM11 processor platform

6：Intel ATOM x86 processor platform

2.2.2 Ordering Information

Series 3: PXA 270 ARM10 processor based

VT-HMI-3081	8.4" TFT, PXA270 520MHz, Ethernet, RS232, RS422/485, USBH, USBD
VT-HMI-3082	8.4" TFT, PXA270 520MHz, Ethernet, 5xRS232, 2xRS422, RS485, 4xUSBH, CAN
VT-HMI-3101	10.4" TFT, PXA270 520MHz, Ethernet, RS232, RS422/485, USBH, USBD
VT-HMI-3102	10.4" TFT, PXA270 520MHz, Ethernet, 5xRS232, 2xRS422, RS485, 4xUSBH, CAN, VGA

Series 5: iMX31 ARM11 processor based

VT-HMI-5071	7" TFT, 16:9 Wide Screen, iMX31 532MHz, Ethernet, RS232, RS422/485, USBH2.0
VT-HMI-5101	10.2" TFT, 16:9 Wide Screen, iMX31 532MHz, Ethernet, RS232, RS422/485, USBH2.0

Series 6: x86 processor based

VT-HMI-6101-1	10.4" TFT, ATOM 1.1GHz, 512MB, 1000M Ethernet, RS232, RS422/485, 4xUSBH2.0
VT-HMI-6101-2	10.4" TFT, ATOM 1.6GHz, 512MB, 1000M Ethernet, RS232, RS422/485, 4xUSBH2.0
VT-HMI-6151-1	15.1" TFT, ATOM 1.1GHz, 512MB, 1000M Ethernet, RS232, RS422/485, 4xUSBH2.0
VT-HMI-6151-2	15.1" TFT, ATOM 1.6GHz, 512MB, 1000M Ethernet, RS232, RS422/485, 4xUSBH2.0

3 VT-HMI-3081 Hardware Instructions

3.1 Product Appearance

Front & Side View

Bottom View

Back View

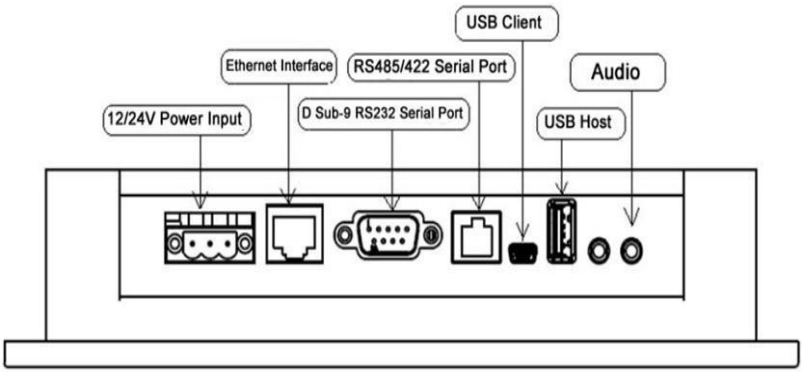
3.2 Specifications

CPU	Processor	Marvell PXA270, ARM10, 520MHz
Memory	On Board RAM	SDRAM 64MB
	On Board ROM	32MB Nor Flash
	External Storage	1x MMC/SD, USB 1.1 Storage
Display	Resolution	8.4",TTL TFT, 4:3, 800 x 600, 16bit Color
	Contrast	500:1
	Brightness	250 cd/m2
	View Angle	50U/70D,60L/70R
	Touch Screen	4 Wires resistance type, Hardness, 4H
Interfaces	Ethernet	10/100-BaseT
	USB	1xUSB1.1 Host,1xUSB1.1 Device
	COM Port	1xRS232, 1xRS422/485
	Audio	1xMIC in 3.5mm, 1xSpeak Out 3.5mm
	Alarm	Buzzer Out
	Printer Port	Printer in USB Interface
	RTC	Supported
Software	OS	WinCE 5.0 or Linux 2.6
	Applications	Provide SDK, support MCGS tool
Power	Input	DC24V (Max range 8-36V)
	Consumption	6.6W

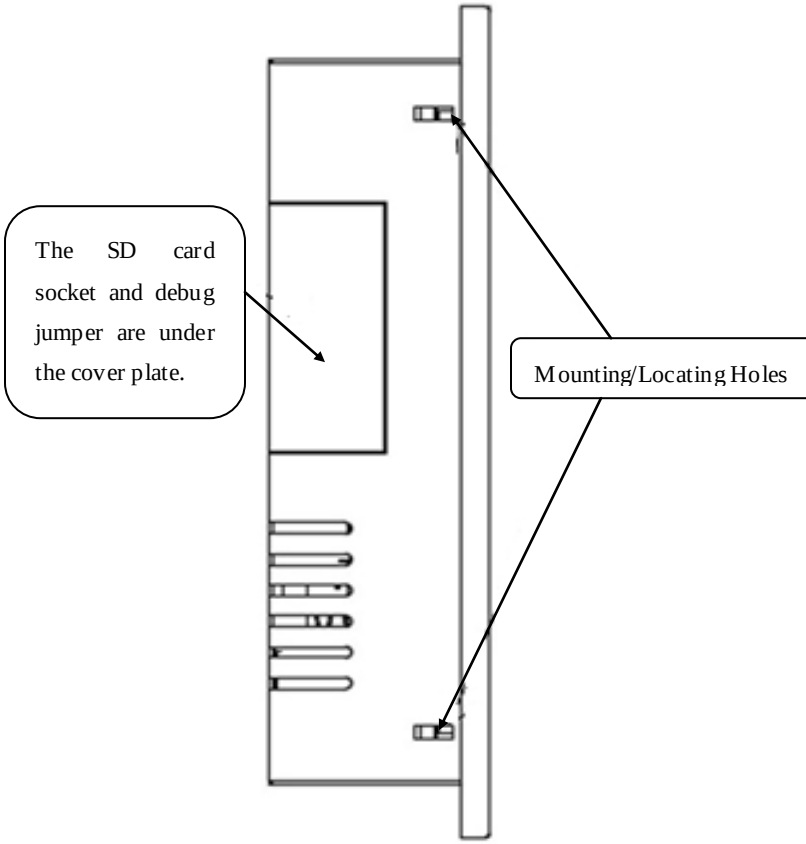
Mechanical	Dimensions	230x188x47mm
	Install Window	212x172 mm
	VESA Install	75x75mm, 3mm Screw
	Weight	1.3Kg
	Enclosure	Aluminum Alloy with Black Color (optional for other colors)
Environment Condition	Temperature	Operating:-10℃ ~+60℃ (ETR:-30℃ ~+70℃ Optional)
		Storage: -20℃ ~+70℃ , (ETR:-40℃ ~+80℃ Optional)
	Humidity	10-85%RH (Non-Condensation), operating and storage
	Vibration	2G, 9-26Hz (10 times in X,Y,Z directions)
	Protection	Front Panel: IP54 (IP65 Optional)
	Cooling Mode	Fan less
	Certifications	FCC and CE

3.3 Interface Instructions

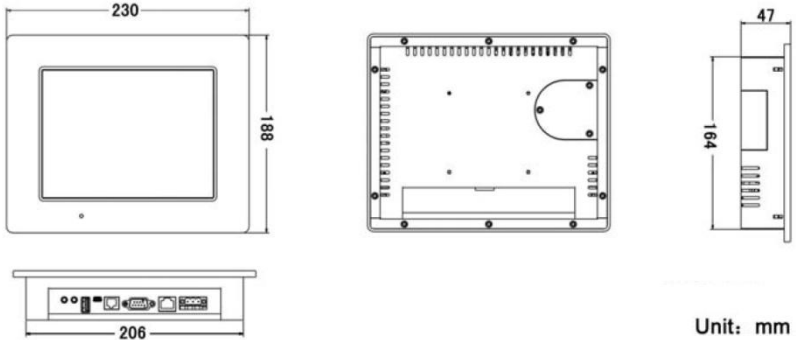
3.3.1 Bottom View



3.3.2 Left View



3.4 Dimension

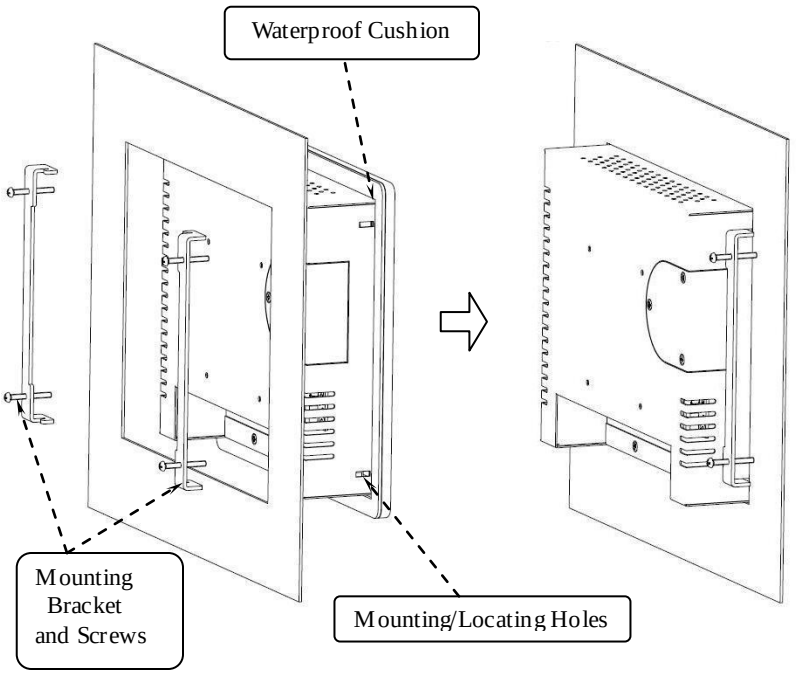


Mounting Window Size: 212x172 mm

3.5 Hardware Installation

The product supports standard VESA mounting (75 x 75mm xΦ3mm) as well as side mounting.

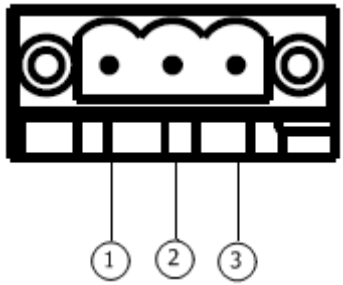
The left and right sides of the device housing have two mounting slots respectively for inserting mounting brackets to needed positions by tightening screws (as shown below):



3.6 Interface Description

3.6.1 DC24V Power Interface

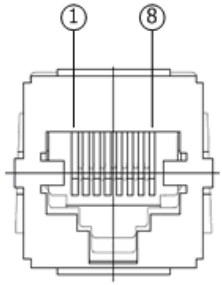
3 pins 5.08mm pitch terminal with screw lock



Pin	Description
1	GND（power ground）
2	Power (+24V DC +)
3	Protection Ground

3.6.2 Ethernet Interface

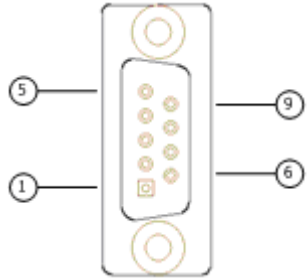
Standard RJ45 interface, supporting 10M/100M self-adaptation



Pin	Description
1	TX+
2	TX-
3	RX+
4	N.C.
5	N.C.
6	RX-
7	N.C.
8	N.C.

3.6.3 D Sub-9 RS232 Connector

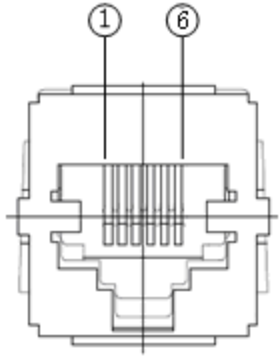
Standard vertical DB-9 male connector, baud rate up to 921, 600bps



Pin	Description
1	DCD
2	RXD
3	TXD
4	DTR
5	GND (ground pin)
6	DSR
7	RTS
8	CTS
9	RI

3.6.4 RS422/485 Connector

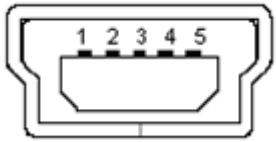
Standard 6 pins RJ 11 interface



Pin	Description
1	TX422＋
2	RX422+/EIA485+
3	GND
4	GND
5	TX422-
6	RX422-/EIA485-

3.6.5 USB Client Connector

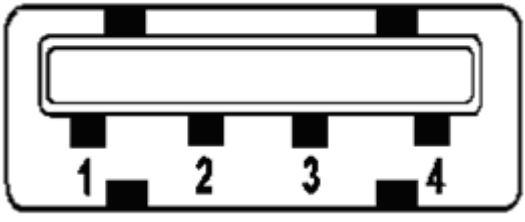
Standard mini-B USB interface



Pin	Description
1	VBUS
2	USB NEG
3	USB POS
4	USB POS
5	GND

3.6.6 USB Host Connector

Standard USB host connector, type A

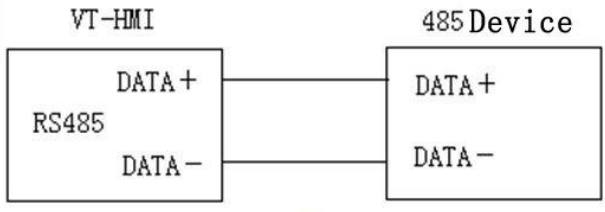


Pin	Description
1	USB VCC
2	USB NEG
3	USB POS
4	GND

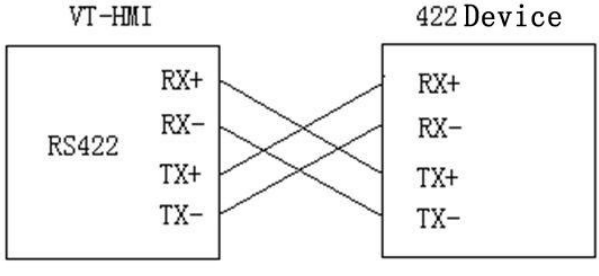
3.7 I/O Interface Instructions

3.7.1 RS485/422

3.7.1.1 485 Cable Connection



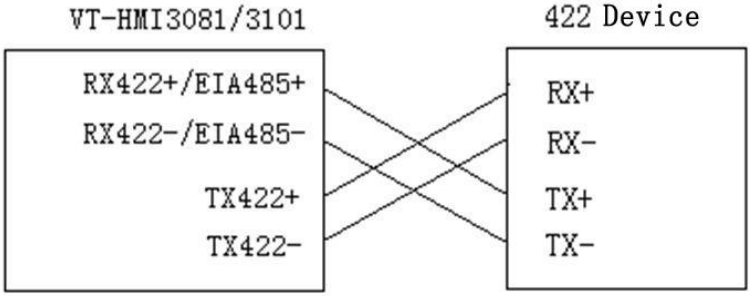
3.7.1.2 422 Cable Connection



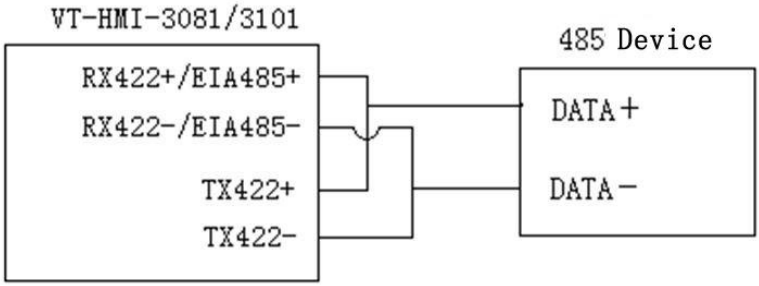
3.7.1.3 RS422/485

RS422 and RS485 share the same RJ11 interface, and the electrical properties thereof are determined according to different connection modes.

- RS 422 wiring suggestion



- RS 485 wiring suggestion



3.8 Packing List

No	Part Description	Quantity	Type
1	VT-HMI Overall	1	
2	User's Manual	1	
3	Utility CD	1	
4	Install Mechanical Tools	1pcs	140040-0006EV,VANTRON
5	Cushion for Enclosure's Front Panel Protection	1pc	140010-0010EV,VANTRON
6	Screw, Mounting Enclosure	4pcs	250010-01001EV,VANTRON
7	Power Terminal(3pins)	1pc	210071-01041EV, ANYTEC:VM-5.08-3P

4 Software Instructions

4.1 Brief Introduction

VT-HMI-3081 has been pre-loaded with WinCE5.0 or embedded Linux image, so that the system can automatically run WinCE 5.0 or embedded Linux when powered up.

4.1.1 Serial Port Instructions

- VT-HMI-3081

  As a default debug serial port, COM1 cannot be used by applications normally. But it can be used after the debug serial port is set to 0 or other serial ports, by setting DebugPort parameters in ADSLOAD.HWT (see 4.2.3.1).

- RS485/422 is COM3.

4.2 WinCE Instructions

4.2.1 WinCE Application Development

4.2.1.1 Development Environment

To create Win32 and MFC applications with EVC4.0 and create Win32, MFC and C# applications with VS2003, VS2005 and VS2008, the integrated development environment (IDE) can be purchased from the agents of Microsoft Company.

4.2.2 WinCE Firmware Update

1） Copy Bootloader (adsload.rom), configuration files (adsload.hwt/adsload. Reg), OS image (nk.bin), and background pictures (adsload.bmp) to the root directory of SD card.

2） Insert the SD card to relevant slot.

3） Power on so that the system can automatically read and update relevant files from the SD card. The updating process can be observed via the debug serial port. The system continues operating after the updating.

4） Power off.

5） Take out the SD card and delete files stored therein.

6） Power on so that the updated items can automatically load and operate.

Cautions:

1. It is our strong suggestion to update firmware carefully because this product recognizes firmware only according to firmware name. Therefore, it is a must to ensure that firmware in the SD card is the required one. You may have to return the product to Vantron for maintenance if the updating of Bootloader（adsload.rom）fails, which may cause loss of time and money.

2. Do not power off during updating.

4.2.3 Instructions for WinCE Configuration Files

WinCE has two configuration files （adsload.hwt/adsload.reg） that can be modified according to your own needs. It is recommended to use configuration files with our technical support. Instructions are listed below:

4.2.3.1 Adsload.HWT

Hardware configuration files can be opened by text editor and you therefore only need the following items and keep other items as hardware compatible settings, the keywords and values of which should be separated by one or more spaces.

```
[TAGS]
MouseDetect     0x01
DebugPort       0x01
BootLogo        0x02
LogoBckGround 0x3B74
```

- ✧ MouseDetect——1: the mouse arrow can be seen after OS is started; 0: other values are invalid without mouse arrow.
- ✧ DebugPort——designate serial port for debugging (default serial port 1); 0: without debug serial port.
- ✧ BootLogo——0: Bootloader dose not display Logo; 1: display Logo consolidated in system; 2: display Adsload.bmp (24bits or 16bits of bitmap files only)

✧ LogoBckGround——designate background color (RGB565 format) of Logo displayed in Bootloader.

4.2.3.2 Adsload.REG

User's registry files can be opened by text editor and are standardized, for example:

```
[HKEY_LOCAL_MACHINE\SOFTWARE\CERDISP]
    "HostName"="192.168.8.88"
    "RefreshTime"=dword:32
    "AllowRemote"=dword:0
```

The system automatically loads when started and you can add system registry information therein according to your own needs.

Notice: The last row of this file must be followed by an Enter.

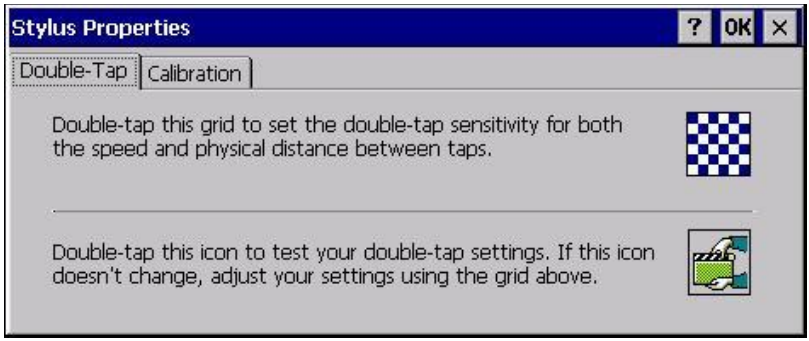
4.2.4 Notice of Touch Screen in WinCE

4.2.4.1 Touch Screen Calibration

To get better touch precision, you need to calibrate before using the touch screen. The calibration comprises steps of selecting "Start\Settings\Control Panel" to step into the control panel interface, tapping

icon to step into "Stylus Properties" interface, and tapping "calibration" to start calibrating. You may use an auxiliary USB mouse for stepping into "Stylus Properties" interface.

After the calibration, run "Regflushkeys.exe" command immediately and save calibration parameters. You can either input command "Regflushkeys.exe" in "Start\Run\"or find the program in "\Windows"directory, run it to update registry.


Stylus Properties
?
OK
Double-Tap
Calibration
Double-tap this grid to set the double-tap sensitivity for both the speed and physical distance between taps.
Double-tap this icon to test your double-tap settings. If this icon doesn't change, adjust your settings using the grid above.

Stylus Properties Picture

4.2.4.2 Setting Touch screen sensitivity and speed sensitivity

The identification precision differences between finger touch and pen touch may results in different touch screen identification effects. Pen touch has better identification effect, while finger touch (especially finger pulp touch) gets relatively poorer precision. Therefore, it is recommended to operate with fingertips or pen, especially at four corners and four sides so as to get optimal touch control effect.

Meanwhile, you can get better double-tap touch control effect by setting double-tap sensitivity and physical distance parameter between two taps. Set according to "Double-Tap" selection" in "Stylus Properties". The physical distance between two taps is recommended to be as great as possible for better finger touch effect. Run "Regflushkeys.exe" command after the setting so as to save the updated registry settings.

4.3 Linux Instructions

4.3.1 Linux Application Development

4.3.1.1 Linux Application Environment

The operation environment of VT-HMI application system is a QT/Embedded open system with the following structure:

<table>
<tr><td colspan="3">Qt/Embedded Applications</td></tr>
<tr><td colspan="2">QWS Server-Graphic Event Service</td><td></td></tr>
<tr><td colspan="3">Qt/Embedded</td></tr>
<tr><td>Frame Buffer</td><td>Input Device Driver</td><td></td></tr>
<tr><td colspan="3">Linux Operating System</td></tr>
<tr><td colspan="3">Low-level Hardware Platform</td></tr>
</table>

Users can develop or transplant Qt/Embedded-based applications to HMI platform.

4.3.1.2 Linux Application Operation

- Manual operation

Copy applications to relevant directory and operate by double-clicking.

- Automatic operation

Copy applications to directory /etc/rcS.d and the system will automatically operate during the next system startup.

4.3.2 Linux Image Programming

Download image files directly onto nor flash via TFTP protocol net.

Flash map here:

0x0-0x40000 U-boot

0x40000-0x80000 U-boot's parameters

0x200000-0x400000 kernel zImage

0x400000-0x780000 used to storage bmp file

0x780000-0x2000000 jffs2 file system

Use U-boot command as below:

1). Replace U-boot

a) tftp a1000000 uboot.bin

b) protect off all

c) erase 0 +40000

d) cp.b a1000000 0 40000

2). Replace zImage

a) tftp a1000000 zImage

b) erase 200000 +200000

c) cp.b a1000000 200000 200000

3).Store bmp file （company logo）

a) tftp a1000000 tl.bmp

b) erase 400000 +40000

c) cp.b a1000000 400000 40000

4). Set U-boot's parameters

a) setenv bootargs console=ttyS0,38400 SERIALGETTY=ttyS0 SERIALBAUD=38400 root=/dev/mtdblock4 init=/linuxrc rootfstype=jffs2 noinitrd

b) setenv bootcmd "memcpy 200000 a0008000 200000 ; bootm"

c) setenv bootdelay 1

d) saveenv

4.3.3 Instructions for Linux Configuration Files

Modification and updating of software configurations are dangerous and may cause system boot failure. Do not modify on your own unless with a good knowledge of each updating files.

4.3.4 start.txt

The system automatically updates and starts scrip without user's modification.

4.3.5 tty_config.txt

Configure debug serial port and baud rate for the device.

- ✧ ${console}: The debug serial port adopted by the device could be set with values such as ttyS0, ttyS1, ttyS2, etc.
- ✧ ${baudrate}: The baudrate adopted by the debug serial port could be 9,600，38,400，115,200, etc.

4.3.6 hw_config.txt

Configure parameters for LCD driven by the device. It functions differently according to different types of device.

Hardware compatibility settings must be kept without random modification.

4.3.7 root_config.txt

Configure items for automatic updating and boot parameters that will be adopted during the boot of updated system, for example: images_to_flash='boot zImage ramdisk.gz flashfs1' is for designating items that need updating.

U-boot image: boot

Linux knernal image: zImage

Linux Ramdisk file system image: ramdisk.gz

Linux jffs2 file system image: jffs2

Files designated by image_to_flash variables must exist in the SD card or USB.

4.3.8 Notice of Touch Screen in Linux

4.3.8.1 Touch Screen Calibration

To get better touch control precision, it is needed to calibrate before using the touch screen, generally get electrified on equipment for the first time. The program prompts for automatic calibration if the touch screen is not calibrated. The system automatically saves calibration parameter after the calibration.

Two methods for stepping into the “calibration” interface are listed below if further calibration is needed:

a) select “Start\Recalibration” command from the menu to step into “calibration” interface.

b) tap “Stylus” icon in “ setting” bar to step into “ calibration” interface.

5 Tips

Waste Disposal

It is recommended to disassemble the device before abandoning it in conformity with local regulations. Please ensure that the abandoned batteries are disposed according to local regulations on waste disposal. Do not throw batteries into fire (explosive) or put in common waste canister. Products or product packages with the sign of “explosive” should not be disposed like household waste but delivered to specialized electrical & electronic waste recycling/disposal center. Proper disposal of this sort of waste helps avoiding harm and adverse effect upon surroundings and people’s health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

Comply with the following safety tips:

Do not use in combustible and explosive environment

Keep away from combustible and explosive environment for fear of danger.

Keep away from all energized circuits.

Operators should not remove enclosure from the device. Only the group or person with factory certification is permitted to open the enclosure to adjust and replace the structure and components of the device. Do not change components unless the power cord is removed. In some cases, the device may still have residual voltage even if the power cord is removed. Therefore, it is a must to remove and fully discharge the device before contact so as to avoid injury.

Unauthorized changes to this product or its components are prohibited.

In the aim of avoiding accidents as far as possible, it is not allowed to replace the system or change components unless with permission and certification. Please contact the technical department of Vantron or local branches for help.

Pay attention to caution signs.

Caution signs in this manual remind of possible danger. Please comply with relevant safety tips below each sign. Meanwhile, you should strictly conform to all safety tips for operation environment.

Notice

Considering that reasonable efforts have been made to assure accuracy of this manual, Vantron assumes no responsibility of possible missing contents and information, errors in contents, citations, examples, and source programs.

Vantron reserves the right to make necessary changes to this manual without prior notice. No part of this manual may be reprinted or publicly released in forms of photocopy, tape, broadcast, e-document, etc.

Chengdu Vantron Technology Ltd.

www.vantrontech.com

Phone: (+86)28-85123930 85123931

85157515 85156320

Fax: (+86)28-85123935

E-mail: sales@vantrontech.com